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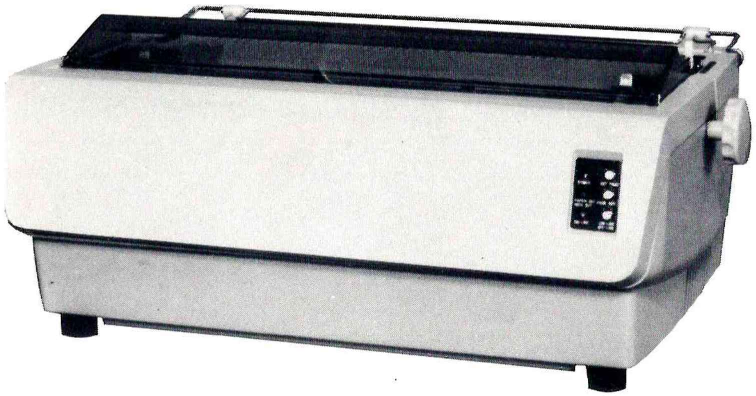
# SERIAL PRINTER
# FP1500-25P

## INSTRUCTION MANUAL



## WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which cause the user at his own expense will required to take whatever measures may be required to correct the interference.

# 5. OPERATION OF INDICATION PANEL SWITCHES

## 5-1. Set Page Switch

Pressing this switch, TOF is set to the present position. When the printer recognizes the operation of this switch, the carrier moves slightly to the right and return to the original position.

## 5-2. Page ADV Switch

When this SW is pushed. The paper is fed to the TOF position. The standard setting is 11 inches. If desired to change this, make the setting on the specifications.

## 5-3. ON-LINE and OFF-LINE Switch

A push SW. Every time the SW is pushed the printer is switched either from ON-LINE to OFF-LINE or OFF-LINE to ON-LINE condition. ON-LINE lamp indicates that the printer is ON-LINE.

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# 1. INTRODUCTION

This serial printer FP1500-25 has been designed as a typewriter for all applications that require high quality printing. By employing CPU 8085 to perform all controls, it has become possible to make vast reduction in the number of electronic parts and to improve the reliability. The mechanical parts have also been decreased and the serviceability greatly simplified. In addition, the following features have been incorporated.

(1) Wheel control is effected by means of servo control dependent on accurate transducer, to enable attaining outstanding printing quality.
(2) Integral constructed frame made by aluminum diecast is used to assure improved maintenance.
(3) Self test mode has been provided for simple and quick detection of trouble in the printer.
(4) For the purpose of attaining longer printing life, automatic control has been provided within the printer to vary the printing pressure to conform with the character shapes.
(5) When the paper is used up, this condition is automatically detected, causing the alert lamp to light and the printing to stop.
(6) Detection is also made when the ribbon (multi-ribbon) is used up.
(7) By means of interior switch, change-over to line print mode such as in dot printer can be made.

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6) BUSY
   a) The output signal at "H" level indicates that data transfer to the printer is disabled.

7) SELECT
   a) The output signal at "H" level indicates that printer is in the SELECT (ON LINE) mode.
   b) After turning power SW ON, after receiving Input Prime, Ex Prime, and ESC SUB I, the printer becomes SELECT (ON LINE) mode.

8) FAULT
   a) The output signal at "L" level indicates that printer is in fault condition.
   b) Sent out at PE*, cover open*, ribbon end, and wheel motor trouble.

   **Note: *** — Option

9) +5V
   a) This is the printer power source voltage +5V, it possible to draw out 50 mA maximum to the exterior.

All the output signals are connected to the TTL SN7437 output terminals.

## 4-4. Description of Signals

1) Data 1 to 8
   - a) Each signal is an input signal to receive the information extending from the 1st to the 8th bit.
   - b) Logic 1 is at H level.
   - c) Data pulse width is minimum 3 µsec.
   - d) Data Line 1 through 8 are pulled up to +5V through 1K ohm resistors and connected to TTL Schmit inverter.

2) Data Strobe
   - a) Synchronous input signal for data reading.
   - b) Normally H and data is latched at strobe rise.
   - c) Pulse width is minimum 1 µsec.
   - d) This signal is pulled up to +5V through 470 ohm resistor, grounded through 33 PF capacitor and received by TTL.

3) Input Prime
   - a) Receiving this signal, the printer goes into initial condition (same as at power ON). However, when signal is received while printing in buffer data, the printer becomes initial condition after completing the printing.
   - b) This signal is pulled up to +5V through 4.7K ohm resistor, grounded through 0.01 µF capacitor, and received by TTL.

4) Ex Prime
   - a) The printer is forcibly stopped at "L" level. When changed from "L" to "H" level, printer goes into initial condition.
   - b) This signal is pulled up to +5V through 4.7K ohm resistor, grounded through 0.01 µF capacitor, and received by TTL.

5) ACK
   - a) This signal is sent out by the printer after executing the control code and after data, SP code or Character code, storing. This is considered to be a data request pulse.
   - b) The normal state is on the high level and the pulse width is about 8 µsec.
   - c) After BSY (INBSY) signal becomes RDY state, this pulse is always output after 6 to 7 µsec.

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# 2. SPECIFICATIONS

| No. | Item | Description |
|---|---|---|
| 1 | Printing speed | 25 characters/sec (Pica pitch) |
| 2 | Printing system | Static type impact printing system |
| 3 | No. of columns | 136 characters (Pica pitch)<br>163 characters (Elite pitch) |
| 4 | Space pitch | 1/120 inch (minimum) |
| 5 | Line pitch | 1/48 inch (minimum) |
| 6 | Return time | 1,000 msec |
| 7 | Line change time | 40 msec (1/6 inch) |
| 8 | Paper width | 381 mm maximum |
| 9 | No. of copies | 3 sheets |
| 10 | Ink ribbon | Black, fabric or multistrike ribbon |
| 11 | No. of printing types | 96 |
| 12 | Character form | Diablo, plastic wheel, convertible |
| 13 | Interface | 8 bits parallel |
| 14 | Power source | 90-127/180-257V, 50/60Hz, 70W |
| 15 | Dime isions (with cover) | 625mm(width) x 380mm(depth) x 258mm(height) |
| 16 | Weight | 19.5kg (with cover and power source) |
| 17 | Ambient conditions | Operating temperature 5 ~36°C<br>Operating humidity 10 ~ 90%RH<br>Storage temperature −25 ~ 60°C<br>Storage humidity 2 ~ 98%RH |
| 18 | Noise | 65 phon or less (1m from platen front face, A scale. Diablo fabric ribbon used) |

# 3. INSTALLATION AND TEST PRINTING

## 3-1. Installation

This printer is of the table-top type so that it can be set on top of an ordinary table for use. However, this printer weighs about 20kg and when in operation, the carriage moving successively to the left and right at certain cycle could cause the table to oscillate together. This factor should be taken into consideration and a proper place selected when setting up the printer.

## 3-2. Checking Before Operation

Before plugging in the power source cord, make the following check:

(1) Make sure that the power switch at the lower left side of the machine is at OFF position. (There is a mark at the upper side of the see-saw switch.)

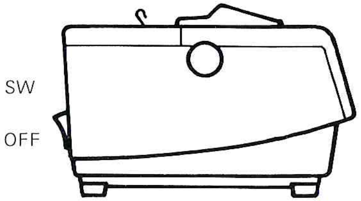


Fig. A

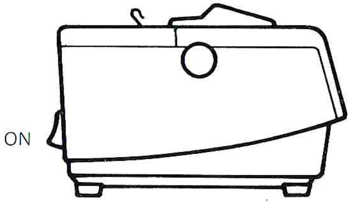


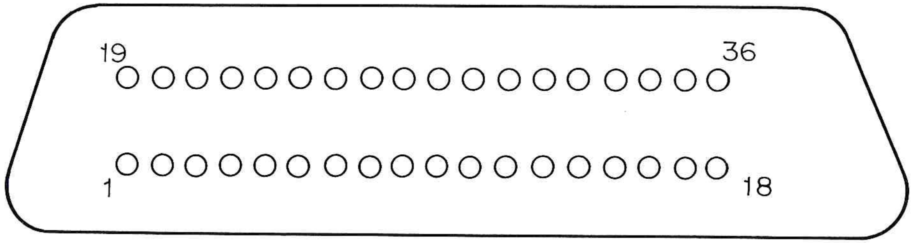
Fig. B

Fig. A shows the case where the side of see-saw switch has not been pressed.

(2) When in packed state the carriage is locked so refer to the mechanism manual and release the lock.

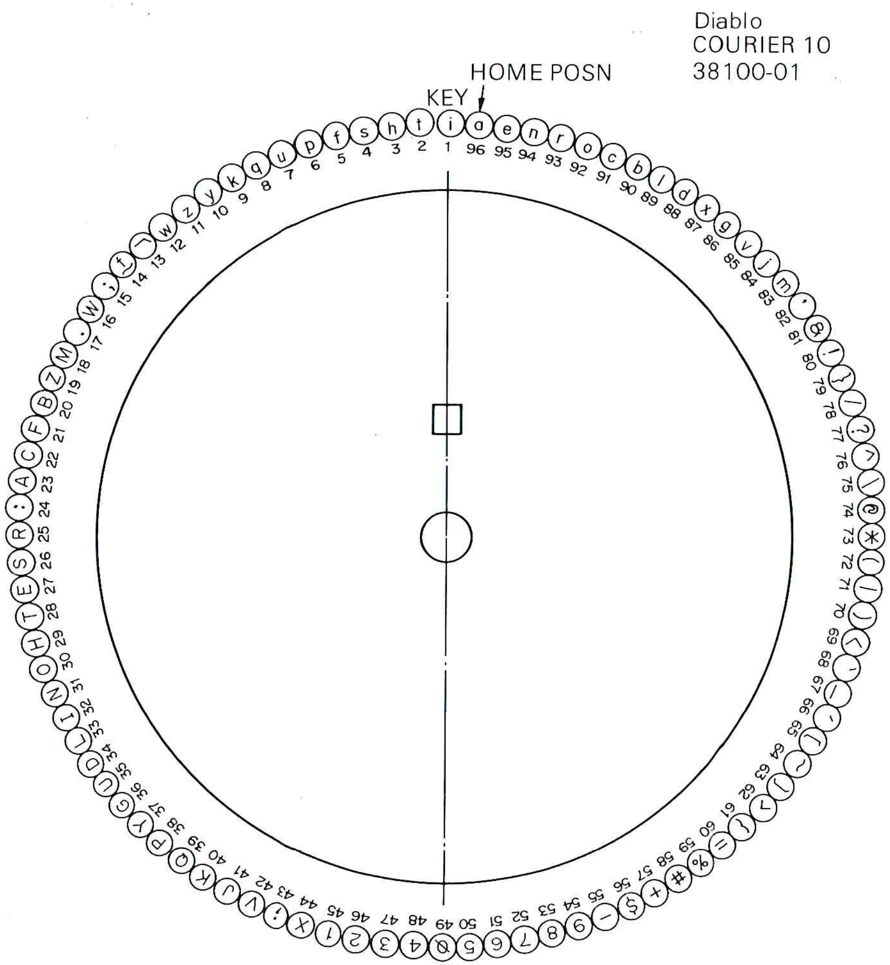
## 4-3. Pin Assignment

| | | | |
|---|---|---|---|
| 1. | $\overline{\text{DATA STROBE}}$ | 19. | TWISTED PAIR GND |
| 2. | DATA 1 | 20. | TWISTED PAIR GND |
| 3. | DATA 2 | 21. | TWISTED PAIR GND |
| 4. | DATA 3 | 22. | TWISTED PAIR GND |
| 5. | DATA 4 | 23. | TWISTED PAIR GND |
| 6. | DATA 5 | 24. | TWISTED PAIR GND |
| 7. | DATA 6 | 25. | TWISTED PAIR GND |
| 8. | DATA 7 | 26. | TWISTED PAIR GND |
| 9. | DATA 8 | 27. | TWISTED PAIR GND |
| 10. | $\overline{\text{ACKNLG}}$ | 28. | TWISTED PAIR GND |
| 11. | BUSY | 29. | TWISTED PAIR GND |
| 12. | PE | 30. | $\overline{\text{INPUT PRIME RETURN}}$ |
| 13. | SLCT. | 31. | $\overline{\text{INPUT PRIME}}$ |
| 14. | ±0V | 32. | $\overline{\text{FAULT}}$ |
| 15. | NC | 33. | NC |
| 16. | ±0V | 34. | $\overline{\text{EX PRIME}}$ |
| 17. | CHASSIS GND | 35. | NC |
| 18. | +5V | 36. | NC |



AMPHENOL (DDK) 57-40360
AMPHENOL (DDK) 57-30360

## 4-2. Print Wheel Arrangement Drawing



Arrangement Drawing seen from wheel rear side

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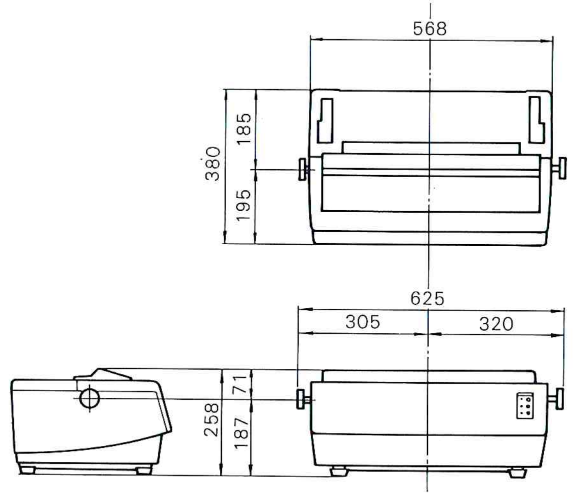
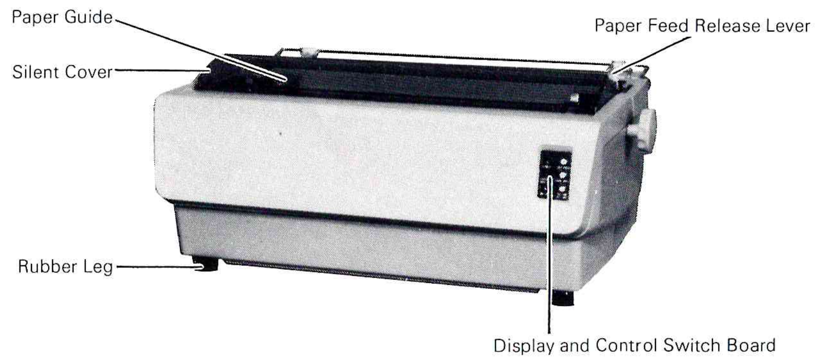
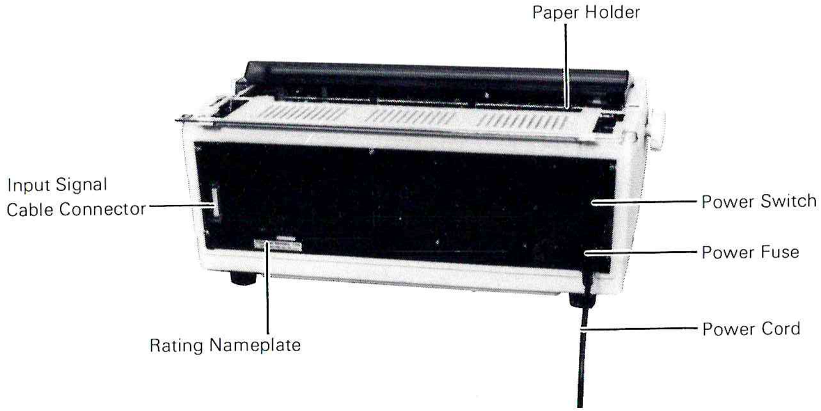
## 3-3. External Views and Names of Components





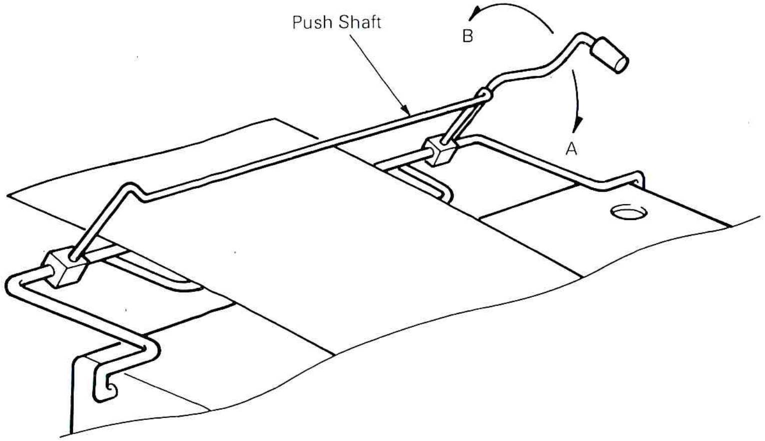


## 3-4. Operation

When operating this printer for the first time, proceed in the following sequence.

(1) Before plugging the power cord into the power source, verify the rated voltage of the machine. (There are 90 ~ 127V series and 180 ~ 254V series.)

(2) Set the printing paper.
When using continuous paper, set the paper-empty device so that it will operate. When using single paper, set the paper-empty device so that it will not function.



When the push shaft is set in arrow A direction as shown above, the paper-empty device will operate when the paper is used up. The alert lamp will then light and the printing will stop.
When using single paper, make the setting in arrow B direction so that the paper-empty device will not work.

(3) Properly set the ribbon cassette.
Check the ribbon cassette to see that it has been set correctly.
There is knob at the right side of the cassette. Slightly turn this knob by hand in the direction indicated on the cassette. Also check the cassette is correctly set, the alert lamp will light and the printer will fail to operate.

(4) Turn on the power switch will cause the carriage to shift to its home position and stop there.

(5) Perform trial printing at selt test mode.
Turn off the power switch. Then while pressing the PAGE ADV switch located at front side indication panel, turn on the power switch once more.
The printing will then be performed in the pattern available inside the printer.

# 4. INTERFACE

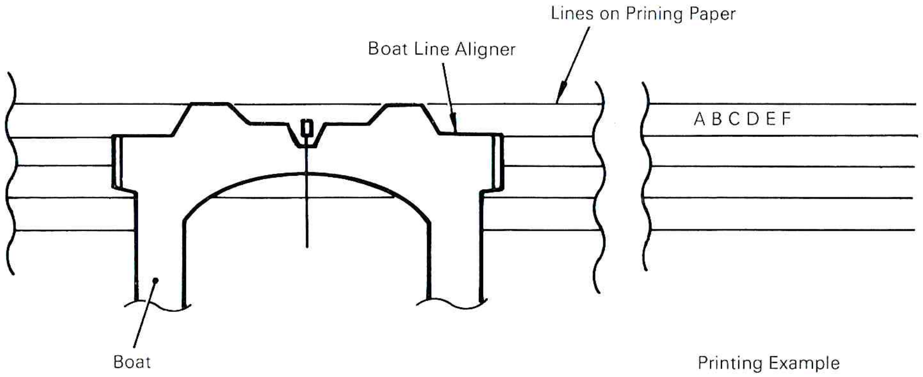
Make the connection to the system by using JAE DM-25P connector and AWG #26-30 wire. Install the pinn wiring correctly in accordance with the pin arrangement shown in following page. For details, refer to the specifications.

## 4-1. ASCII Code Chart

| | | | | | Function code | | Letter Code (exclusive of "SP" and "DEL") | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | b7 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| | | | | b6 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| | | | | b5 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| b4 | b3 | b2 | b1 | NC | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 0 | 0 | 0 | 0 | 0 | (NUL) | (DEL) | SP | 0 | 0 | P | ' | p |
| 0 | 0 | 0 | 1 | 1 | (SOH) | DC1 | ! | 1 | A | Q | a | q |
| 0 | 0 | 1 | 0 | 2 | (STX) | (DC2) | " | 2 | B | R | b | r |
| 0 | 0 | 1 | 1 | 3 | (ETX) | DC3 | + | 3 | C | S | c | s |
| 0 | 1 | 0 | 0 | 4 | (EOT) | (DC4) | $ | 4 | D | T | d | t |
| 0 | 1 | 0 | 1 | 5 | (ENQ) | (NAK) | % | 5 | E | U | e | u |
| 0 | 1 | 1 | 0 | 6 | (ACK) | (SYN) | & | 6 | F | V | f | v |
| 0 | 1 | 1 | 1 | 7 | (BEL) | (TEB) | ' | 7 | G | W | g | w |
| 1 | 0 | 0 | 0 | 8 | BS | CAN | ( | 8 | H | X | h | x |
| 1 | 0 | 0 | 1 | 9 | HT | (EM) | ) | 9 | I | Y | i | y |
| 1 | 0 | 1 | 0 | 10 | LF | (SUB) | * | : | J | Z | j | z |
| 1 | 0 | 1 | 1 | 11 | VT | ESC | + | ; | K | [ | k | ( |
| 1 | 1 | 0 | 0 | 12 | FF | (FS) | , | < | L | \ | l | \| |
| 1 | 1 | 0 | 1 | 13 | CR | GS | — | = | M | ] | m | ) |
| 1 | 1 | 1 | 0 | 14 | (SO) | RS | . | > | N | ∧ | n | ~ |
| 1 | 1 | 1 | 1 | 15 | (SI) | US | / | ? | O | — | o | (DEL) |

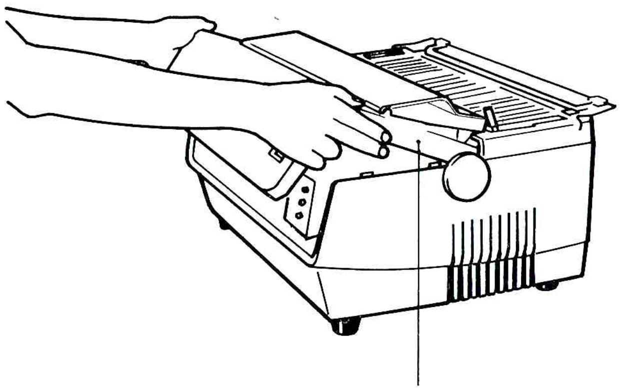
The parenthesized codes do not perform any controlling functions and are not used. However, after the ESC code is used, the parenthesized codes may be used if necessary.

## (9) Printing alignment



Printing paper lines are adjusted by utilizing the line adjusters at the left and right sides of the boat.
For example, if the printing paper line is aligned against the boat line aligner, the bottom sides of the letters will be aligned with the line in the printing paper as shown in the printing example.

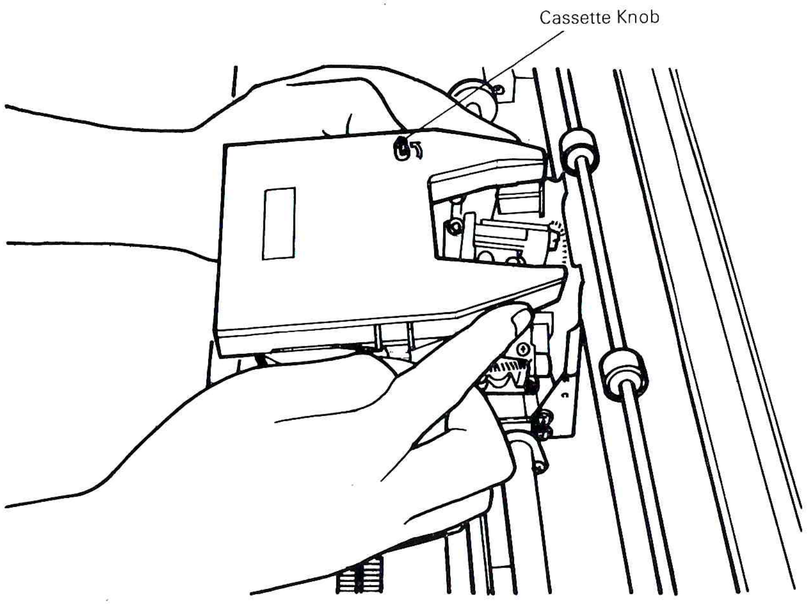
## (6) remove the cover.


Surface Fitting against Top Cover Rear.

Removal:
When replacing the ribbon due to the printing becoming faint or when found necessary to replace the print wheel, remove the upper cover by strongly raising up the front side with both hands as illustrated.
Place the cover on a flat place so as to prevent the silent cover B at the upper part from becoming damage. (Silent cover B is made integral.)

Installation:
After replacing the ribbon or the print wheel (related later), in reverse manner to removal, strongly press down the top cover front. If pressed down with the top cover rear positioned properly, the two protrusions extending out from the bottom cover left and right sides will fit into the grooves in top cover front at complete the installation.

(7) Ribbon cassette replacement



Removal:

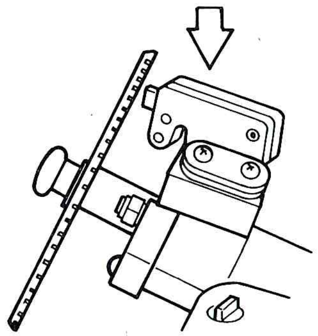
Since the carrier stop claws are hooked on to the cassette stop claws, remove the cassette by lifting it up while pressing down on the cllaws at the left and right sides. (See sketch above)

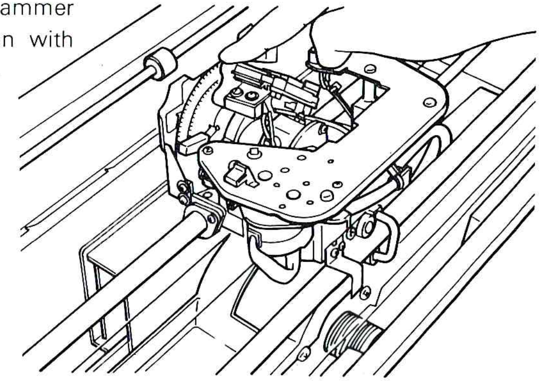
Installation:

1) Take up the slack in the ribbon by turning the cassette knob in arrow direction.
2) Insert the ribbon from above in between the two guide plates at the left and right side of boat.
3) Pull the cassette behind and lower it after positioning the left and right stop claws against the cassette stopper. The cassette will now be mounted in correct position. Then, turn the cassette knob and tighten the ribbon.

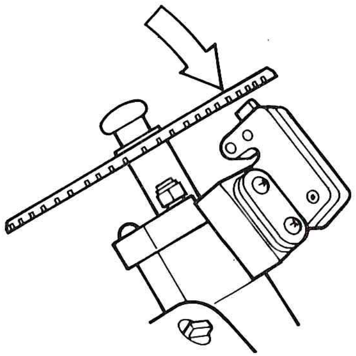
(8) Print wheel replacement

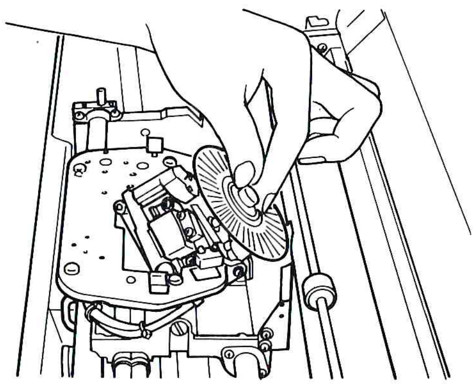
While pressing down hammer mechanism in arrow direction with one finger lower the lock lever.





When lock lever is released from adjust screw, pressing it further to rear will cause it to turn in arrow direction.





When finished turning, pull out print wheel stop rubber strongly upward. When loosened to certain degree, push up rear side and remove.

Install by performing above in reverse order.